

LOMATIUM SWINGERAE: A NEW SPECIES OF LOMATIUM (UMBELLIFERAE)  
FROM THE JOSEPH PLAINS, IDAHO, U.S.A.

Richard P. McNeill

1507 S Gonzales Street  
Las Vegas, New Mexico 87701, U.S.A.  
juniper.botany@gmail.com

ABSTRACT

**Lomatium swingerae** R.P. McNeill is a new species described from one population on the Joseph Plains, between the Salmon River and Snake River, Idaho, U.S.A. It co-occurs with *L. cous* and is morphologically most similar to *L. bicolor* var. *leptocarpum*. It is easily distinguished from *L. cous* based on morphology of the ultimate segments, involucre bractlets and mericarps, and from *L. bicolor* var. *leptocarpum* based on habitat, overall size of the plant, structure of the primary and secondary umbels, the ultimate segments and phenology.

RESUMEN

**Lomatium swingerae** R.P. McNeill es una nueva especie que se describe de una población de José Llanos, entre el río Salmón y el río Snake, Idaho, EE.UU. Se da junto con *L. cous* y es morfológicamente muy similar a *L. bicolor* var. *leptocarpum*. Se distingue fácilmente de *L. cous* por la morfología de los segmentos finales, brácteas involucrales y mericarpos, y de *L. bicolor* var. *leptocarpum* por su hábitat, el tamaño total de la planta, la estructura de las umbelas primarias y secundarias, los segmentos finales y fenología.

KEY WORDS: New species, *Lomatium*, *Lomatium swingerae*, Umbelliferae, Apiaceae, Salmon River, Snake River, Idaho, Endemic, Joseph Plains

Distinctive landforms and geomorphic processes in conjunction with large-scale patterns of climate change have resulted in unusual patterns of plant distribution in North Idaho. Consequently, it is home to many rare and endemic species, and many disjunct populations of species that are normally distributed either west of the Cascade Mountains or east of the Rocky Mountains (Brunsfeld et al. 2001; McNeill 2012). In 2008, I discovered an anomalous taxon of *Lomatium* on the Joseph Plains, the most northern point of land separating the Salmon River and the Snake River (Fig. 1). It was not possible to key this taxon reliably in the Flora of the Pacific Northwest or the Intermountain Flora (Cronquist et al. 1994; Hitchcock et al. 1961). I revisited the site four times between 15 May 2008–3 July 2014 attempting to collect specimen with mature fruit and to locate other populations. Mature fruits were finally collected on 3 July 2014 and no other populations have been found. The taxon was locally common, with approximately several thousand individuals occurring at the site, 86 individuals were collected for use in this description. Morphologically this species is most similar to *Lomatium bicolor* J.M. Coult. & Rose var. *leptocarpum* (Torr. & A. Gray) Schlessman and co-occurs with *L. cous* J.M. Coult. & Rose.

**Lomatium swingerae** R.P. McNeill, sp. nov. (Figs. 2–3). TYPE: U.S.A. IDAHO, IDAHO CO.: on ridge top along Divide Creek Road, on Joseph Plains between the Salmon River and the Snake River, ca. 8 km from junction with Flynn Creek Rd. and ca. 35 km W of Grangeville, elev. 1285 m, S slope of 0–15 %, 45.85183055°-116.57732222°, dry open meadow in *Pinus ponderosa* forest, shallow, dry soils, very rocky, with mosses filling most of the rock interspaces, soil and rock derived from middle Miocene basalt flows, 27 May 2014, Rick McNeill s.n. (HOLOTYPE: ID; ISOTYPES: to be distributed).

*Lomatium swingerae* differs from congeners by geographical and/or ecological separation, phenology, leaf morphology, umbel size/structure, involucre bractlet shape, pedicel length, mericarp size/structure and root morphology.

**Plants** acaulescent, perennial, 6.5–32.0(–42.0) cm tall, glabrous to papillate. **Roots** tuberous thickened, moniliform, or globose, with a simple or rarely branched, subterranean caudex, 1.9–6.6 cm below ground level. **Leaves** basal, glabrous, 1–3 leaves per stem; **petioles** sheathing the stem, extending 0–80.8 mm beyond sheathing, old leaf bases ± present; **blades** 19.5–127.7 mm long, 18.8–229.2 mm wide, tripinnate, generally withered by the time the fruits are mature; **ultimate segments** 14–28 per 1 cm<sup>2</sup>, acerose, with mucronate apices, 1.2–14.5 mm long, 0.1–0.9 mm wide, erect from either side of the rachis, pseudofasciculate and appearing

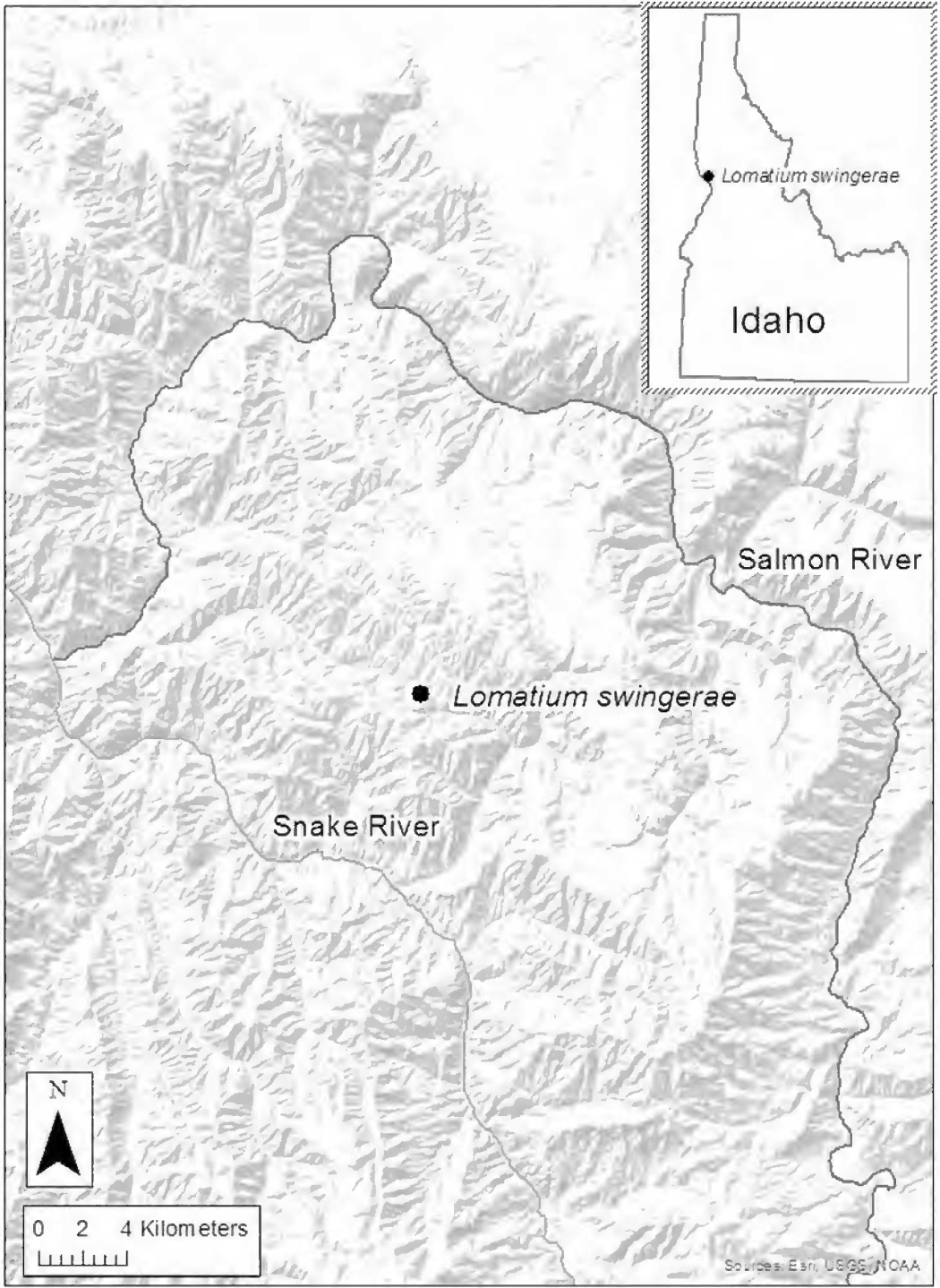


Fig. 1. Joseph Plains and the location of *Lomatium swingerae*.

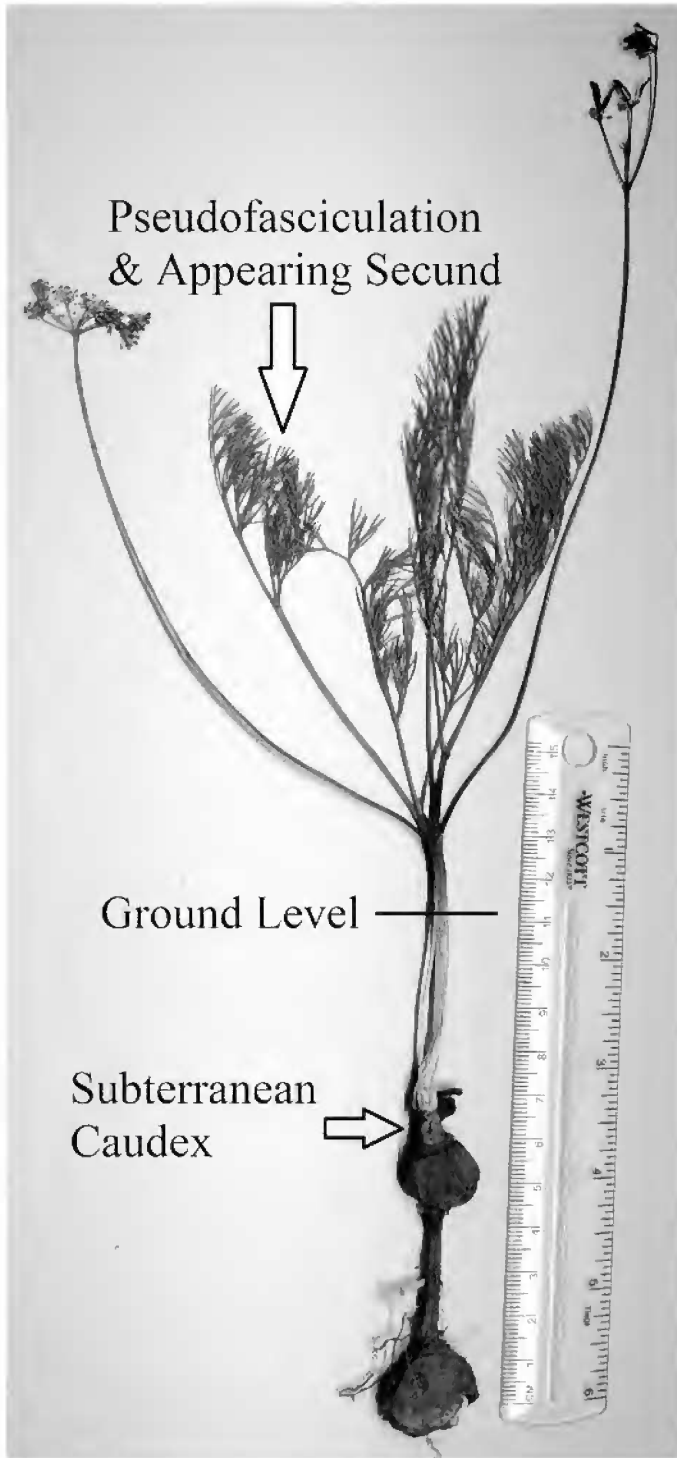


FIG. 2. *Lomatium swingerae*: habit (from holotype, Rick McNeil s.n., ID), note subterranean caudex and pseudofasciculation of the leaflets with secund appearance.

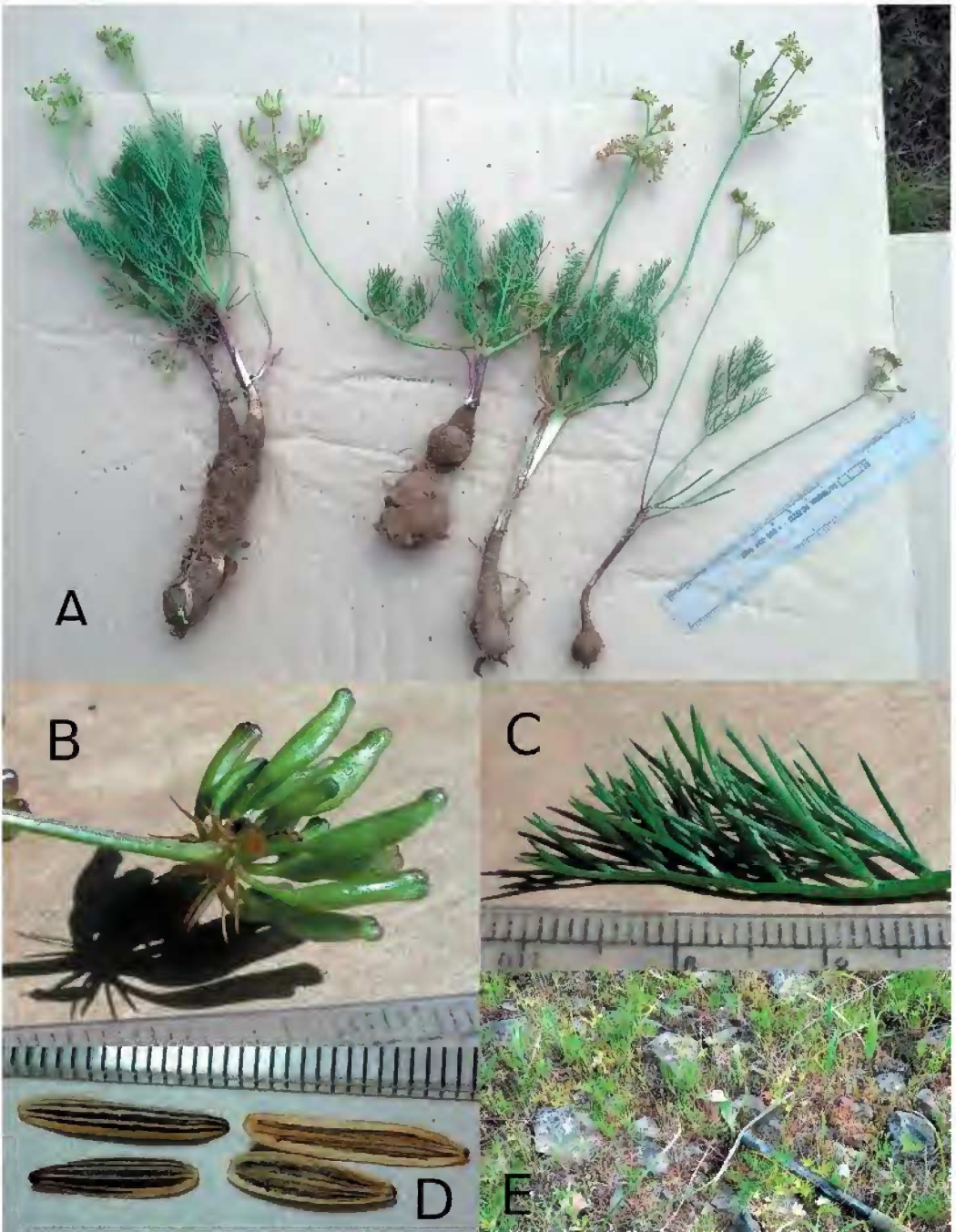


FIG. 3. *Lomatium swingerae* (all scale is mm or a 15 cm ruler): A. Root morphology and simple/branched caudices. B. Involucel bractlets and immature fruits. C. Ultimate segments of leaf: notice acrose form, pseudofasciculation and secund appearance. D. Mericarps: dorsal and ventral view, and E. Habitat.



secund. **Scapes** 1–3, 3.3–28.0(–38.5) cm long, ascending, corrugated, glabrous to papillate. **Inflorescence** compound umbel, glabrous to papillate; **involucre** absent; **rays** (1–)2–10, 10.9–60.4 mm long, ascending to erect. **Flowers sepals** 5, connate, inconspicuous; **petals** 5, yellow, obcordate; **ovary** superior, two carpellate, two styles, two yellow, exserted anthers, filaments yellow; **pedicels** 1–4.3(–6.2) mm long; **involucrel bractlets** spreading to slightly reflexed at maturity, 0.3–2.1(–3.5) mm long, to 0.2 mm wide, narrowly lanceolate to narrowly oblanceolate, withering by the time the of mature fruits; **mericarps** ensiform or gladiate, deplanate or revolute, 10.0–16.5(–18.3) mm long, (0.87–)1.9–3.3(4.0) mm wide, lateral wings  $\pm$  present, up to 0.5 mm wide, less than or equal to  $\frac{1}{2}$  as wide as the body, dorsal ribs 3(4); **vittae** interval 1 between each rib, commissural 2–4(–6), may be obscure, or incomplete; **stylopodia** yellowish tan, smooth to paleaceous; **carpophore** yellowish tan, 9.3–15.0 mm long.

*Distribution and Phenology*.—Occurring in a dry, open, rocky meadow. Flowering March through June and fruiting June through July.

*Etymology*.—The specific epithet is for Lindsay Ann Swinger, botanist and friend.

*Lomatium swingerae* is only superficially similar to *L. cous*, both tending to be small for *Lomatium*s; *L. swingerae* typically under 3.2 dm and *L. cous* typically under 3.5 dm. They can be distinguished from each other by the morphology of the mericarps, involucrel bractlets, and the size and shape of the ultimate segments. The wings on the mericarps of *L. cous* are as wide or nearly as wide as the body, while in *L. swingerae* the lateral wings may or may not be present, if present, are up to  $\frac{1}{2}$  as wide as the body. *Lomatium cous* has broad, distinctive involucrel bractlets that are oblanceolate, obovate or elliptic, while the bractlets of *L. swingerae* are narrowly lanceolate to narrowly oblanceolate. *Lomatium cous* has relatively broad (up to 3mm) and leaf-like ultimate segments, while on *L. swingerae* the ultimate segments are narrow (0.1–0.9 mm) and acerose. *Lomatium swingerae* can be distinguished from *Lomatium bicolor* var. *leptocarpum* by the arrangement and shape of the ultimate segments, the arrangement of the primary and secondary umbels, the size of the plant and habitat. *Lomatium bicolor* var. *leptocarpum* has ascending ultimate segments that are long (10–50 mm) and broad (0.5–2 mm), while the ultimate segments of *L. swingerae* are erect from both sides of the leaf rachis, pseudofasciculate, appearing secund, shorter (1.2–14.5 mm long) and narrower (0.1–0.9 mm wide). The primary umbel of *Lomatium bicolor* var. *leptocarpum* is appressed, while *L. swingerae* is erect to ascending. *Lomatium bicolor* var. *leptocarpum* has very crowded mericarps due their size and the short pedicels, while *L. swingerae* generally has smaller mericarps and longer pedicels that result in less crowding. *Lomatium bicolor* var. *leptocarpum* is generally 1–5 dm tall, while *L. swingerae* is generally no taller than 3.2 dm rarely, 4.2 dm, and finally *L. bicolor* var. *leptocarpum* occurs in wet meadows, and ephemeral pools, usually with high clay content soils, while *L. swingerae* is found in a dry, rocky meadow (Schlessman 1984).

*Lomatium swingerae* has only been found in one location, on the Joseph Plains, which is a high plateau separating the Salmon River and Snake River approximately 35 km west of Grangeville, ID. The Salmon River and Snake River have created canyons on three sides of the Joseph Plains that are approximately 980 m lower than the plains, and up to 16 km wide. *Lomatium swingerae* occurs in an open rocky meadow with very little soil development. The rocky interspaces are filled with mosses, soil, and roots. This soil and rock are derived from the middle Miocene flood-basalt flows, occurring between 16–11.6 million years ago (Bond et al. 1978). Basalt-derived soils tend to be influenced more by climate than the mineral composition of the parent material, so the uniqueness of the habitat is likely due to the landscape position on top of an exposed, dry ridge rather than the result of any special properties of the basalt (Kruckeberg 2002). *Lomatium swingerae* flowers from March to June and the fruit mature in late June through July, with timing largely dependent on seasonal variation. It is also distinctive from the other *Lomatium*s on the Joseph Plains in that it flowers and fruits before the five other species: *Lomatium ambiguum* J.M. Coult. & Rose, *L. cous*, *L. dissectum* (Nutt. ex Torr. & A. Gray) Mathias & Constance, *L. bicolor* var. *leptocarpum* and *L. triternatum* J.M. Coult. & Rose ssp. *platycarpum* (Torr.) Cronquist. On 27 May 2014, *Lomatium swingerae* had green fruits, while all the other *Lomatium*s were in flower, and on 3 July 2014, both *L. swingerae* and *L. cous* had mature fruits, but *L. bicolor* var. *leptocarpum*, *L. triternatum* ssp. *platycarpum* and *L. dissectum* had immature fruits. Only *Lomatium cous* and *L. triternatum* ssp.

*platycarpum* have been found within 2 km of the population of *L. swingerae*. *Lomatium cous* and *L. swingerae* grow next to each other in the rocky areas of the meadow. In the nearby soils that are less rocky, deeper or wetter, only *L. cous* is found. *Lomatium triternatum* ssp. *platycarpum* is found on the edge of the meadow, in less rocky, deeper soils that are partially shaded by the trees. *Lomatium swingerae* occurs in association with the following species: *Allium tolmiei* Baker ex J.M. Coulter var. *platyphyllum* (Tidest.) Ownbey, *Balsamorhiza incana* Nutt., *Castilleja chromosa* A. Nelson, *Crepis atribarba* A. Heller ssp. *atribarba*, *Delphinium depauperatum* Nutt., *Erigeron bloomeri* A. Gray, *Erigeron englemannii* A. Nels., *L. cous* J.M. Coult. & Rose, *Microsteris gracilis* (Hook.) Greene var. *gracilis*, *Orobanche uniflora* L. var. *purpurea* (Heller) Achey, and *Poa bulbosa* L.

PARATYPES: U.S.A. IDAHO. Idaho Co.: plateau between the Salmon and Snake Rivers, elev. 1259 m, 45°51.392'N, 116°34.493'W, S + N slope 1–40%, meadow in *Pinus ponderosa* woodland, rocky soil, 21 May 2008, Rick McNeill s.n. (ID); on ridge top along Divide Creek Road, on Joseph Plains between the Salmon River and the Snake River, ca. 8 km from junction with Flynn Creek Rd, and ca. 35 km W of Grangeville, elev. 1285 m, S slope: 0–15%, 45.85183055°/-116.57732222°, dry open meadow in *Pinus ponderosa* forest, shallow, dry soils, very rocky, with mosses filling most of the rock interspaces, soil and rock derived from middle Miocene basalt flows, 3 Jul 2014, Rick McNeill s.n. (ID).

*Lomatium swingerae* is endemic to northern Idaho, known from only one population and should be considered for listing as a sensitive species. The limited geographic range and single known population make it extremely vulnerable to extirpation.

#### KEY TO LOMATIUM TAXA OF THE JOSEPH PLAINS, IDAHO

1. Involucel bractlets absent \_\_\_\_\_ **L. ambiguum**
1. Involucel bractlets present.
  2. Involucel bractlets broadly oblanceolate to broadly obovate or elliptic, wing of the mericarp equal or nearly as wide as the body, root tuberous thickened or globose \_\_\_\_\_ **L. cous**
  2. Not with the above combination of characters.
    3. Flowers purple, plants 5–15 (20) dm tall, large woody taproot \_\_\_\_\_ **L. dissectum**
    3. Flowers yellow, if plants over 5 dm tall, then slender taproot, or cormose thickened, not large and woody.
      4. Wing of the mericarp nearly as wide as the body, ultimate segments few, less than 10 per cm<sup>2</sup> \_\_\_\_\_ **L. triternatum**  
ssp. **platycarpum**
      4. Wing of the mericarp narrow, less than ½ of the body, ultimate segments many, more than 10 per cm<sup>2</sup>.
        5. Plant growing in wet meadows or ephemeral pools, ultimate segments ascending, 1–5 cm long, 0.5–2 mm wide, rays of primary umbels appressed, mericarps crowded, root short and cormose thickened to more elongate and slender \_\_\_\_\_ **L. bicolor** var. **leptocarpum**
        5. Plants growing in dry rocky meadows, ultimate segments erect, pseudofasciculate, appearing secund, 0.1–1.5 cm long, 0.1–0.9 mm wide, rays of primary umbels erect or ascending, mericarps not crowded, root globose, moniliform or tuberous thickened \_\_\_\_\_ **L. swingerae**

#### ACKNOWLEDGMENTS

I would like to thank Todd Ott for his help with collections, Cort Anderson for providing accommodations while I was collecting and Don Mansfield, and Stephen R. Downie for their thoughtful and timely reviews. The following herbaria contributed specimen, use of equipment and space to sort collections: the Stillinger Herbarium (ID) University of Idaho, the Rocky Mountain Herbarium (RM) University of Wyoming, and the Marion Ownbey Herbarium (WS) Washington State University. Finally, I would like to thank Barney Lipscomb for his help and patience.

#### REFERENCES

- BOND, J.G., J.D. KAUFFMAN, D.A. MILLER, & R. VENKATAKRISHNAN. 1978. Geologic map of Idaho. Idaho Bureau of Mines and Geology, with contributions from U.S. Geological Survey, scale 1:500,000.
- BRUNSFELD, S.J., J. SULLIVAN, D.E. SOLTIS, & P.S. SOLTIS. 2001. Comparative phylogeography of northwestern North America: a synthesis. In: J. Silvertown, and J. Antonovics, eds. Integrating ecological and evolutionary processes in a spatial context. Blackwell Science, Oxford, UK. Pp. 319–339.
- CRONQUIST, A., N.H. HOLMGREN, & P.K. HOLMGREN. 1994. Intermountain flora: vascular plants of the intermountain west, U.S.A., Vol. 3: part A subclass Rosidae (except Fabales). New York Botanical Garden Press, Bronx, NY, U.S.A.
- HITCHCOCK, C.L., A. CRONQUIST, M. OWNBEY, & J.W. THOMPSON. 1961. Vascular plants of the Pacific Northwest, part 3: Saxifragaceae to Ericaceae. University of Washington Press, Seattle, U.S.A.

KRUCKEBURG, A.R. 2002. *Geology and plant life: the effects of landforms and rock types on plants*. University of Washington Press, Seattle.

McNEILL, R.P. 2012. *Lomatium brunsfeldianum*: a new species of *Lomatium* (Umbelliferae) from Northern Idaho. *J. Bot. Res. Inst. Texas* 6(1):29–36.

SCHLESSMAN, M.A. 1984. Systematics of tuberous *Lomatiums* (Umbelliferae). *Syst. Bot. Monogr.* 4:1–55.